

WHAT IS CLAIMED IS:

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5 1. A millimeter band signal transmitting/receiving system, comprising a transmitter transmitting a signal wave with a millimeter band a propagation path forming portion forming at least one propagation path for propagation of said signal wave, and a receiver receiving a plurality of said signal waves from a plurality of propagation paths of a line of sight propagation path to said transmitter and said at least one propagation path.

2. The millimeter band signal transmitting/receiving system according to claim 1, wherein said propagation path forming portion includes a reflector arranged to reflect said signal wave transmitted from said transmitter and direct said reflected signal wave to said receiver.

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3. The millimeter band signal transmitting/receiving system according to claim 2, wherein said reflector is arranged substantially almost in parallel to an imaginary line between said transmitter and said receiver.

4. The millimeter band signal transmitting/receiving system according to claim 2, wherein said reflector has a thin film including aluminum.

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5. The millimeter band signal transmitting/receiving system according to claim 2, wherein said reflector has its surface covered by an insulating material.

6. The millimeter band signal transmitting/receiving system according to claim 2, wherein said reflector has its surface covered by a transparent insulating material.

7. The millimeter band signal transmitting/receiving system

according to claim 2, wherein a plurality of said reflectors are arranged to form said plurality of propagation paths for propagating said signal waves to said receiver.

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8. The millimeter band signal transmitting/receiving system according to claim 1, wherein said receiver always simultaneously receives said plurality of signal waves from said plurality of propagation paths in a normal state.

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5 9. The millimeter band signal transmitting/receiving system according to claim 1, wherein said receiver and said transmitter are provided inside a house, said propagation path is a structural component defining an internal space of said house and reflecting a signal wave transmitted from said transmitter, and said transmitter is spaced by a prescribed distance from said structural component defining said internal space of said house for transmitting said signal wave with the millimeter band at a transmission angle of at least a prescribed value.

5 10. The millimeter band signal transmitting/receiving system according to claim 9, wherein each of said prescribed distance and said transmission angle of at least said prescribed value is determined depending on a region for propagation of said plurality of signal waves and a positional relation between said transmitter and said receiver.

5 11. A millimeter band signal transmitting/receiving system, comprising a plurality of transmitters for a millimeter band and a receiver arranged to simultaneously receive a plurality of signal waves output from said plurality of transmitters, said plurality of signal waves transmitted from said plurality of transmitters having a same frequency.

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12. The millimeter band signal transmitting/receiving system according to claim 11, wherein each of said plurality of transmitters includes a local oscillator oscillating at a prescribed local oscillator

frequency for generating said signal wave at said same frequency.

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13. The millimeter band signal transmitting/receiving system according to claim 12, wherein said local oscillators are in synchronization with each other.

14. The millimeter band signal transmitting/receiving system according to claim 11, wherein said receiver always simultaneously receives said plurality of signal waves in a normal state.

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5 15. A house provided with a millimeter band signal transmitting/receiving system, comprising a structural component defining an internal space and a millimeter band signal transmitting/receiving system, wherein said millimeter band signal transmitting/receiving system includes a transmitter transmitting a signal wave with a millimeter band, a propagation path forming portion arranged in said structural component for forming at least one propagation path for propagation of said signal wave, and a receiver simultaneously receiving a plurality of signal waves through a plurality of propagation paths of a line of sight propagation path to said transmitter and said at least one propagation path.  
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16. The house provided with the millimeter band signal transmitting/receiving system according to claim 15, wherein said propagation path forming portion has a reflector reflecting an output from said transmitter and said reflector is arranged on a surface of said component.

17. The house provided with the millimeter band signal transmitting/receiving system according to claim 15, wherein said propagation path forming portion has a reflector reflecting an output from said transmitter and said reflector is arranged inside said component.

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